



Can nursing strengthen one health initiatives?

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ABSTRACT

The One Health framework emphasizes the interdependence of human, animal, and environmental health. Nurses, as the largest group of healthcare professionals and often the first point of contact with patients and communities, routinely engage in activities aligned with One Health objectives, including vaccination campaigns, community education, infection prevention, environmental monitoring, and the management of non-communicable diseases. Despite this, nursing contributions remain largely unrecognized, and One Health principles are seldom integrated into education, practice, or policy frameworks. This paper highlights the critical role of nursing in operationalizing One Health and identifies barriers to its recognition. It provides targeted recommendations to embed One Health into nursing curricula, promote experiential learning, support continuing education, foster research, formalize nursing roles, strengthen interdisciplinary collaboration, leverage digital technologies, and enhance professional advocacy and leadership. Recognizing and supporting nursing in One Health can significantly strengthen global health initiatives.

1. Introduction

The One Health framework, championed by the Quadripartite Alliance of the Food and Agriculture Organization of the United Nations, the World Health Organization, the World Organization for Animal Health, and the United Nations Environment Programme, recognizes that human, animal, and environmental health are intrinsically interconnected. It advocates for collaborative, interdisciplinary strategies to prevent, detect, and respond to health threats [1]. Within this framework, six action tracks have been identified, covering the prevention, surveillance, and control of emerging, re-emerging, and endemic zoonoses; antimicrobial resistance; reduction of food safety risks; the strengthening of health systems through a One Health-oriented approach; and the improved integration of environmental issues [1]. Importantly, the One Health paradigm extends beyond disease prevention to encompass health promotion, resilience building, and the enhancement of well-being across humans, animals, and ecosystems [2]. Traditionally, One Health initiatives have emphasized the roles of veterinarians, physicians, and public health professionals. Nurses, despite their critical presence in healthcare systems and frequent first contact with communities, are rarely highlighted in this discourse. Against this backdrop, this short communication aims to highlight the critical role of

nursing in operationalizing One Health, identify barriers to its recognition, and propose targeted recommendations to advance its integration into nursing education, research, practice, and leadership.

2. Nursing contributions to one health

A closer examination of daily nursing practice reveals that nurses are already engaged in activities directly aligned with One Health objectives. Across hospital, primary care, and community settings, nurses lead or collaborate on initiatives closely connected to the core of One Health. They administer and advocate for vaccination campaigns [3], educate communities on hygiene and zoonotic risks [4], implement public health programs that reduce the burden of foodborne and vector-borne diseases [5], monitor environmental factors affecting health [6], and support infection prevention and control measures [7]. Furthermore, nurses play a central role in managing and preventing non-communicable diseases (NCDs) [8], which, although not explicitly addressed in the current Joint Plan of Action, are highly relevant within a One Health perspective [2]. NCDs are influenced by environmental and social determinants, further linking nursing practice to One Health principles. In all these activities, nurses operate at the intersection of human, animal, and environmental health, embodying One Health principles, even if neither the nurses

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themselves nor the broader health system explicitly frame their work in this context.

Consider vaccination as an illustrative example. Nurses routinely advocate for and administer vaccines against influenza, rabies, and other infectious diseases with zoonotic potential. Beyond the technical act of administration, they educate communities about the importance of vaccination, address misinformation, and reinforce preventive behaviors [3]. These actions not only prevent human disease but also mitigate risks at the human-animal interface, embodying the One Health approach in practice. Similarly, nurses provide guidance on environmental and household risks, including sanitation practices, vector control, and hygiene measures that reduce exposure to pathogens [5]. Such interventions inherently encompass One Health objectives: preventing disease transmission between humans and animals and mitigating environmental hazards that compromise health.

In community health, nurses often serve as the bridge between policy and practice. They train volunteers, lead educational workshops, and implement surveillance systems that enable early detection of outbreaks [4]. Through these efforts, communities are informed, engaged, and empowered to adopt preventive measures, fostering resilience against health threats. Even in clinical settings, nurses contribute to One Health goals by monitoring antimicrobial use, supporting stewardship programs, and educating patients and families about the risks of antimicrobial resistance [9,10]. These routine actions demonstrate that nurses' everyday practice is deeply intertwined with One Health objectives, yet the connection remains largely invisible in policy, literature, and health system structures.

3. Barriers to integration

The under-recognition of nursing within One Health is multifactorial. Historically, nursing education has been predominantly human-centric. Nevertheless, nursing conceptualizes the context in which the person lives as a core component of its metaparadigm, the environment, which encompasses interconnected elements including animals, and is systematically articulated with the concepts of person, health and nursing. Despite this conceptual foundation, nursing curricula rarely incorporate One Health explicitly or provide structured opportunities for interdisciplinary collaboration with veterinary or environmental health professionals [11].

Evidence suggests that gaps in One Health knowledge extend across multiple health professions, not only within nursing. Nurse educators acknowledge having limited knowledge regarding the One Health approach [11]. Likewise, surveys conducted in medical schools across the United States reveal that only a minority offer formal instruction on One Health [12]. Broader analyses highlight a pressing need to embed One Health concepts systematically within curricula, ensuring that all future healthcare professionals, including nurses, are equipped to respond effectively to emerging and the multifaceted challenges of global health [2,13].

Consequently, many nurses may not recognize that a significant portion of their daily practice aligns with One Health objectives. Furthermore, institutional and policy frameworks rarely acknowledge or connect nursing interventions to One Health, leaving the profession's contributions underutilized and the concept peripheral in routine practice [14].

The consequences of this invisibility are both practical and significant. Without explicit recognition of the nursing role within One Health, opportunities for structured collaboration, systematic data collection, and coordinated interventions are at risk of being lost. Furthermore, the lack of integration of One Health concepts into nursing education means that new graduates enter the workforce without an understanding of their potential contributions to this interdisciplinary framework, thereby perpetuating a cycle of invisibility and underappreciation.

4. Embedding one health in nursing education and practice: recommendations

Embedding One Health principles into nursing education and practice is essential to fully leverage the profession's potential in advancing global health. Integrating One Health literacy from the outset of training equips nurses not only with clinical skills but also with a conceptual framework that promotes holistic, systems-oriented thinking. Nursing programs should incorporate core One Health topics, and experiential learning opportunities, such as community projects, field placements, and case studies can reinforce the interconnectedness of human, animal, and environmental health, fostering a systems-thinking mindset among students [13,15].

Beyond education, institutional recognition and policy integration are critical. Health systems should explicitly incorporate nursing roles into One Health strategies, defining contributions and responsibilities across domains such as disease prevention, environmental monitoring, and community engagement, among others, and adapting these functions to local needs and evolving priorities. Interdisciplinary collaboration should be formalized, ensuring that nurses participate alongside veterinarians, physicians, environmental scientists, and public health professionals in planning, decision-making, and response activities [16]. Data collected by nurses in clinical and community settings should feed into One Health surveillance, informing policy, interventions, and the evaluation of outcomes.

Based on these considerations, the following recommendations are proposed to strengthen nursing contributions to One Health initiatives:

- i. Integrate One Health into nursing curricula: Include dedicated modules on One Health principles, covering zoonoses, environmental health, ecosystem dynamics, antimicrobial resistance, and interdisciplinary collaboration to develop early awareness and competence among students;
- ii. Promote experiential learning: Encourage community projects, fieldwork, simulation exercises, and case studies that demonstrate the interconnections between human, animal, and environmental health;
- iii. Support continuing education: Provide ongoing professional development in One Health concepts for practicing nurses to update knowledge, promote best practices, and strengthen workforce capacity;
- iv. Foster research in One Health nursing: Promote studies that document and evaluate nurses' contributions to One Health, generating evidence to support policy and practice;
- v. Formalize nursing roles in One Health policies: Define nursing responsibilities at institutional, national, and global levels to ensure accountability, recognition, and integration into broader One Health strategies;
- vi. Strengthen interdisciplinary collaboration: Establish structures that enable nurses to work alongside veterinarians, physicians, environmental scientists, and public health professionals in surveillance, outbreak response, preventive interventions, and health system planning;
- vii. Raise professional awareness: Encourage professional organizations and nursing associations to highlight nurses' contributions to One Health in conferences, publications, and policy briefs;
- viii. Strengthen advocacy and leadership in One Health: Equip nurses to serve as leaders in health committees, decision-making bodies, and interdisciplinary groups, advocating for policies that systematically integrate One Health principles.

Strengthening nursing's role in One Health is not merely a matter of recognition; it is a strategic imperative. Nurses possess a unique combination of clinical expertise, community insight, communication skills, and the capacity to implement preventive and promotive interventions across diverse settings. Their continuous presence in healthcare systems

and close engagement with communities position them as essential actors in translating the One Health paradigm beyond disease prevention toward health promotion, resilience building, and the enhancement of well-being for humans, animals, and ecosystems. By formalizing and supporting their role, One Health initiatives can become more effective, responsive, and sustainable. Nurses transform global One Health objectives into practical, locally meaningful actions, ensuring that the interdependencies between human, animal, and environmental health are comprehensively addressed and that integrated, holistic outcomes are achieved across all domains.

5. Conclusion

Nurses are already contributing to the practice of One Health in their everyday work; however the concept remains underappreciated and poorly integrated into nursing education, policy, and institutional frameworks. Recognizing this reality presents an opportunity to enhance the effectiveness of One Health initiatives. Embedding One Health principles into nursing curricula, fostering interdisciplinary collaboration, and explicitly linking nursing interventions to One Health objectives would enable the profession to fully realize its potential. By doing so, the health of humans, animals, and the environment can be more effectively safeguarded, positioning nursing as a cornerstone of One Health strategies worldwide.

CRedit authorship contribution statement

Júlio Belo Fernandes: Writing – review & editing, Writing – original draft, Supervision, Conceptualization. **Diana Vareta:** Writing – review & editing, Writing – original draft, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

No data was used for the research described in the article.

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